

The Quality of Use of Learning Management Systems in Ugandan Public Universities: Do user-perceived performance and motivation to learn really matter?

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<https://doi.org/10.58653/nche.v11i1.03>

(Accepted: 13th October 2023/Published: 25th October 2023)

Abstract

The COVID-19 pandemic brought about profound global teaching and learning management shifts. Numerous higher education institutions in Uganda turned to Learning Management Systems (LMS) to adapt. Despite the contemporary digital age and the notable increase in Information and Communications Technology (ICT) investments in universities, LMS in Ugandan public universities have remained unpopular. Hence, an in-depth examination is needed, focusing on users' perceived performance and its influence on the LMS quality of use. It also considered the mediating role of motivation to learn in this intricate relationship. The research methodology employed was quantitative, utilising a cross-sectional design. A total of 707 participants were selected through a multi-stage sampling process, yielding a response rate of 93%. The hypotheses formulated for this investigation were rigorously tested using Stata software, employing structural equation modelling estimation techniques. The findings revealed a significant influence of users' perceived performance on the LMS quality of use. However, contrary to the initially hypothesised mediation effects, the indirect influence of perceived performance on the LMS quality of use, as mediated by motivation to learn, experienced a reduction from an initial 0.65 to .034. The study's conclusions underscore the enduring importance of perceived performance as a pivotal factor in shaping the quality of LMS utilisation. Nevertheless, it is essential to acknowledge that the interplay between perceived performance and motivation to learn in mediating this relationship is more complex and multifaceted than originally anticipated. This nuanced understanding of the dynamics involved in resource-constrained environments offers fresh insights into educational technology adoption and adaptation.

Keywords: Learning Management Systems; User perceived performance; Motivation to learn.

Introduction

The COVID-19 pandemic has compelled universities to seek more efficient and effective means of conducting their operations with minimal in-person interactions. The universities' operational efficiency and effectiveness hinge on users' proficiency in navigating the learning management system. Consequently, these systems' comprehensive quality of use has emerged as a pivotal concern. The successful development and implementation of learning management systems necessitate thorough analysis, robust technical construction, and user-centric design. Neglecting these aspects typically results in underutilisation or non-adoption of the system (Fisher, 1999; Sastry Musti, 2019). Hence, the success of a system is contingent upon its extent of use and its relevance or perceived performance from the user's perspective, offering valuable insights into the quality of use. In striving for a superior quality of use, Learning Management Systems (LMS) users should effectively, efficiently and satisfactorily achieve their objectives (P. Weichbroth, 2018; Paweł Weichbroth, 2020). The quality of use within a LMS is ascertained by its capacity to facilitate seamless and effective teaching and learning experiences while addressing the distinctive requirements of both learners and educators.

In the light of the above definitions, the quality of use of LMS is looked at in the context of how effective and efficient a learner management platform is in achieving specified activities (Mtebe, 2015). These activities include the management of students' academic affairs, offering an integrated platform for educational materials, distribution, administration and management of learning. The accessibility of LMS by a range of users, including academic staff (faculty), students and content producers (Mtebe, 2015) is also considered in the definition of quality of use of LMS. In this case, the users of the systems are primarily the students and the academic staff. In this study, quality of use is applied from the perspective of public universities in Uganda socially at a time when the COVID-19 pandemic has changed many sectors, including the education sector, where information systems have significantly replaced face-to-face operations.

The Government of Uganda has undertaken deliberate initiatives to support institutions of higher learning in developing LMS for education (Kasse & Balunywa, 2013; Tulinayo et al., 2018; Uganda Communications Commission, 2014). Further, the national ICT budget for the financial year 2020/2021 increased by 12% compared to the previous fiscal year. The increase was meant to foster digital transformation programmes intended to boost the quality of use of LMS (Budget Speech, 2020; NDP III).

Despite the initiatives, the utilisation of LMS has continued to be unpopular among students and academic staff. Ten public universities in Uganda are reported to have digital platforms; however, these are partially used to recruit and enrol students. As of 2018, 84.2% of Makerere University and Kyambogo University students had never used the LMS (Tulinayo et al., 2018). The Makerere University Annual Report (2019) revealed that though students showed much enthusiasm in the early years of digital technology, the use decreased after the first five years. Research shows that the problem is not that students are unaware. However, there are other factors, such as the quality of use of the technologies, and attitude (Olum et al., 2020). For instance, learners lobby facilitators for physical classes in place of allotted online lectures, and the same applies to facilitators opting for physical lectures.

Owing to the unpopularity of the LMS among users, the government and universities have continuously lost resources invested in online learning infrastructure. The cost of education has also remained high, and services have continued to be constrained, including a decline in enrolment figures for international students (NCHE, 2017). The unpopularity of LMS in universities also saw 192,346 students and 7,666 academic staff confined to their homes with little progress in learning and teaching for six months during the COVID-19 pandemic when institutions were closed (Businge, 2020). The failure of universities to use LMS affects students' enrolment and ranking. Additionally, the low usage of LMS reinforces the necessity for the proper implementation of the digital transformation programme under the third Ugandan National Development Plan (NDP III) and SDG 4, which requires institutions to use digital technologies (Sinha & Bagarukayo, 2019). This study is hinged on two theories, namely: 1) The Expectation Confirmation Theory (ECT) by Oliver (1980), extended by Bhattacharjee (2001b); and 2) The Social Cognitive Learning Theory by Bandura (1989).

Against this background, the overarching purpose of this research is to examine the mediating effect of motivation to learn in the relationship between perceived performance and quality of use of LMS.

Related Literature

In a study on LMS, Gegenfurtner et al. (2016) found that participants who had high motivation to learn had a higher perception of the quality of use of the system than those with low motivation to learn. Researchers have attributed low quality of use perception to the lack of sensitisation to the usefulness of the systems, poor attitude of users (Tulinayo et al., 2018), poor alignment of user characteristics, tasks and needs to the system (Alonso-Ríos et al., 2010), and the lack of motivation by learners (Kasse, Moya & Nansubuga, 2015; Zaharias, 2009). The above studies mainly take an adoption theoretical perspective. The post-adoption approach has largely been disregarded.

Even before the advent of the COVID-19 pandemic, Uganda had already implemented LMS. Take, for example, Makerere University, a premier institution in Uganda, which introduced its first LMS nearly two decades ago. However, these systems have struggled to find traction among users. Why is this so? To understand this, we need to consider a shift in perspective, examining the relevance and application of two theories – the Expectation Confirmation Theory (ECT) and the Social Learning Theory (SLT). We will examine whether these theories can shed light on user perceptions of LMS quality of use and, therefore, their low popularity in Ugandan public universities.

User perspectives have been recognised as important factors in enhancing the quality of use of LMS. Therefore, the current study acknowledges the significance of ECT, developed by Oliver (1977, 1980) as a cognitive theory to explain post-adoption satisfaction. Its determinants are expectations, perceived performance, confirmation of beliefs and satisfaction (Bhattacharjee, 2001). In this study, we focus on perceived performance and satisfaction with the quality of use of the LMS. According to ECT, system users often have initial expectations regarding the system's usability, functionality and overall learning experience. These expectations are based on their prior experiences with other LMS or computer interactions. User satisfaction with the quality of use of the LMS will depend on whether the system's actual performance meets or exceeds their expectations. For instance, if the LMS is user-friendly, offers a wide range of interactive features and provides effective learning resources, learners are more likely to be satisfied and view the system as meeting their expectations. On the other hand, if the LMS is difficult to navigate, has limited features or lacks sufficient learning materials, learners may feel dissatisfied as the actual performance falls short of their expectations.

The study considered Bandura's social cognitive learning theory to understand the user's personal learning characteristics. This theory introduces the concept of observational learning, proposing that the motivation to learn directly impacts the success of learning. Bandura (1989, 1999) asserts that an individual's motivation and willingness to learn greatly influence their ability to remember information, apply behavioural models and effectively utilise motor skills. Motivation to learn can be categorised as intrinsic (i.e. driven by personal interest and enjoyment) or extrinsic (i.e. influenced by external factors like rewards or avoiding negative consequences). To enhance motivation and support effective learning experiences, various strategies that improve attention, relevance, confidence and satisfaction can be employed. Based on these principles, the current study focuses on examining the concept of motivation and its impact on the quality of use of LMS in Ugandan public universities.

Studies have revealed that students who encounter internet-related challenges perceive the use of digital platforms as an inconvenience, which negatively influences their motivation to learn and increases dissatisfaction with the quality of use of digital platforms (Azhari & Ming, 2015). Moreover, once a user perceives a system to be compatible with other digital technologies available to them, the chances of using the LMS are higher. Some studies suggest that a user's motivation to learn affects the relationship between perceived performance and the quality of use of the LMS. A more favourable perception of the quality of use further motivates the use of the system. In their study, Zaharias and Poylymenakou (2009) found that the motivation-to-learn strategies of attention, relevance, confidence and satisfaction significantly impacted the perception of the quality of use. Research also indicates that intrinsic and extrinsic motivation were

found to be key predictors of the behavioural intention to use technology (Davis et al., 1992; Vallerand, 1997). Yoo et al. (2012) went further to compare the impact of intrinsic and extrinsic motivation in their study on promoting e-learning in workplaces. Their results revealed that intrinsic motivators affected e-learning at workplaces more strongly than extrinsic motivators and that extrinsic motivation had no direct effect on behavioural intention. It is, therefore, hypothesised that:

H1: Perceived performance has a positive influence on motivation to learn.

H2: Motivation to learn positively influences the quality of use of LMS in Ugandan public universities.

H3: Perceived performance positively influences the quality of use of LMS in Ugandan public universities.

H4: Motivation to learn mediates the relationship between perceived performance and quality of use of LMS in Ugandan public universities.

Research Approach and Methods

In this study, the researcher followed a quantitative survey research design. Specifically, a cross-sectional design (Sekaran & Bougie, 2016) was followed. The prevalence of COVID-19 in Uganda was considered, hence the relevance of the cross-sectional research design. A self-administered questionnaire divided into two main sections with closed-ended questions was used. The first section had questions about the characteristics of respondents. In contrast, the second section had questions about the main variables of the study.

The sampling formula by Krejcie and Morgan (1970) was used to determine the sample size. The study adopted a multi-stage sampling procedure involving two levels. This type of sampling design is an efficient sampling method that incorporates two or more stages of random sampling based on the hierarchical structure of natural strata (Dudovskiy, 2016). In this study, the population was divided using the regions that the respondents belonged to, the universities they worked in, and their status in each of these universities (*students or academic staff members*). When dividing the population, the presence of these stages (levels) of focus made using a multi-stage sampling design necessary. The first stage of sampling was the stage of the region. The four regions of Uganda were considered. Because the number is small, all four regions were selected to form part of the sample at the region's stage. The second stage of sampling was the public universities from each region. After selecting the universities, 383 students and 332 academic staff were selected.

The questions about the study's variables were structured using the five-point Likert scale (Jebb et al., 2021). The study comprised three variables: motivation to learn, perceived performance, and the quality of use of LMS. Motivation to learn was measured by assessing the students' and academic staff members' intrinsic and extrinsic factors associated with learning in their context (Nielsen, 2018). On the other hand, perceived performance was measured by assessing the students' and academic staff's perceived quality of outputs and perceived systems compatibility. The quality of use of LMS was measured by assessing the efficiency, memorability, satisfaction, learnability, error tolerance and effectiveness of the LMS used for learning in public universities in Uganda (OECD, 2019; Fan & Wolters, 2014; Zaharias, 2009).

Data processing, data cleaning and analysis

The study employed Stata software to carry out the analysis work. The data was also subjected to a missing data analysis to ascertain that the data captured in the Stata software was complete. The test for outliers was also conducted to establish whether any data points in the data set were not within the acceptable data range. Considering that the sample size was over 80 participants, a Z-score in the range of +3 and -3 was used as the border marks, beyond which a data point was regarded as an outlier (Hair et al., 2010).

The questionnaire reliability was checked by conducting a pilot study while model quality assessment using explanatory factor analysis (EFA) to ascertain the variable measurements by observing the factor loadings of the measures to specific variables. The variable measurements ascertained using EFA were further confirmed by confirmatory factor analysis (CFA). Structural equation modelling

was used to test the mediation effect of motivation to learn on the relationship between perceived performance and quality of use.

Findings

In this section, the researcher was interested in establishing whether there is a relationship between perceived performance and the quality of use of LMS. Specifically, this relationship was focused on the aspect of the influence of the former on the latter. Based on the conceptualisation of these variables in this research, they were mediated by the “motivation to learn”. Therefore, this section of the research study focused on the four previous research hypotheses.

This mediation analysis was carried out using Stata structural equation modelling estimation techniques and the results are presented below.

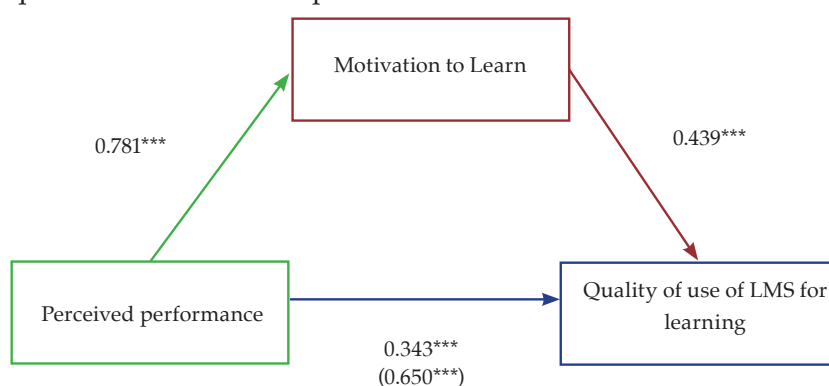


Figure 1: Mediation output – Perceived performance; Motivation to learn; Quality of use of LMS.

Note: *** $p < 0.001$

Based on the results obtained, perceived performance of the LMS has a significant influence on the motivation of a user of the LMS to learn more about the LMS ($\beta = 0.781, p < 0.001$). This means that what users perceive to be practical helps to psychologically motivate them to learn more about something or a product. In the context of this study, the learning process is about the LMS that is used in teaching and learning in public universities in Uganda.

The results of the analysis indicate that motivation to learn has a partial mediation effect in the influence of perceived performance on the quality of use of LMS in public universities in Uganda. This partial mediation led to the reduction in the percentage influence of perceived influence on the quality of use of LMS from 65% ($\beta = 0.650, p < 0.001$) to 34.3% (or $\beta = 0.343, p < 0.001$). The partial mediation, therefore, accounts for a 52% reduction in the influence of perceived performance on the LMS quality of use.

In summary, hypotheses 1 through 4 were supported by the data. The total effect of perceived performance on quality of use is $\beta = 0.650, p < 0.001$ [c-path]. The direct effect of perceived performance on quality of use after controlling for the mediator is $\beta = 0.307, p < 0.001$ [c'-path]. The indirect effect of perceived performance through motivation to learn is $\beta = 0.343, p < 0.001$ [a x b]. The proportion of the total effect mediated is 0.52. In contrast, the ratio of indirect to direct effect is 1.117, and the ratio of total to direct effect is 2.117. This means that the proportion of the total effect that is mediated is almost 52%, which is a respectable amount. However, one key thing to note here is that the mediation is in an unexpected direction.

Discussion of Findings

This research aimed to examine the influence of perceived performance on the quality of use of LMS. Additionally, this study aimed to explore the potential mediating role of motivation to learn in the relationship between perceived performance and quality of use of LMS.

The empirical findings of this research underscore a positive relationship between perceived performance and the quality of use of LMS. Moreover, this investigation's outcomes reveal that mediation exists, albeit in a partially unexpected direction. Specifically, the mediation effect of perceived performance through motivation is found to be less pronounced than the total effect within the model. This observation carries significant implications.

First and foremost, it underscores that motivation to learn may not hold as pivotal a role as initially presumed in this model. Several factors might contribute to this observation. Firstly, the mandatory nature of LMS usage could diminish the significance of user motivation, as individuals may engage with the platform out of necessity rather than intrinsic motivation. Secondly, in many developing countries, users of LMS often rely on human intermediaries due to limited access to devices or inadequate technological proficiency. In such cases, external social support may mitigate the influence of individual motivation. Lastly, it is worth noting that this study measured motivation at an individual level, potentially overlooking the dynamics of shared device usage. Indeed, in situations involving shared devices, the significance of individual motivation may be diminished.

This diverges from the finding by other scholars that motivation is a key factor (Davis et al., 1992; Vallerand, 1997). These findings are also contrary to those of the study of Burke and Moore (2003) and Smart and Cappel (2006) where it was concluded that the more users perceive a benefit to their learning experience, the more likely they will be motivated to learn and perform well irrespective of the challenges they may face (Burke & Moore, 2003; Smart & Cappel, 2006). In a parallel vein, most individuals within the sample group were novices encountering this technology for the first time. As a result, these users may find themselves less equipped to formulate intricate assessments of perceived performance, a factor that fundamentally shapes their motivation and the overall quality of their engagement with the technology.

Conclusion and Recommendations

In conclusion, although perceived performance continues to significantly influence the quality-of-use experience in LMS, it is imperative to recognise that the interplay with motivation to learn is more intricate than originally presumed. These findings carry profound implications for the strategic formulation and execution of LMS, particularly in settings marked by communal device utilisation and the presence of external support mechanisms. We advocate establishing a comprehensive support ecosystem encompassing training, mentorship programmes, and accessible call centres. Additionally, enhancing various determinants that stimulate the motivation to learn, such as optimising the learning environment, emerges as a critical endeavour. This multifaceted approach is likely to yield enhanced outcomes and foster a more effective and engaging LMS experience for all stakeholders.

Ethical Considerations and Inclusion Criteria

In the light of the involvement of human subjects in this research, it was imperative to adhere to rigorous ethical standards. As articulated by Bryman (2008), ethics encompasses the indispensable principles that researchers must uphold to conduct high-quality research while safeguarding the rights and well-being of respondents and referenced scholars. This section outlines the conscientious measures implemented to ensure that the research adhered to the highest ethical standards.

First and foremost, before the commencement of data collection, participants were approached and asked for their informed consent to partake in the study willingly. This procedure was meticulously executed to ensure the absence of any form of coercion or undue influence on the participants. Participants were explicitly informed of their freedom to withdraw at any study stage without incurring any adverse consequences. Furthermore, participants were not remunerated for their involvement in the research, a deliberate choice to mitigate the potential for biased responses. The decision to abstain from financial incentives was also aimed at fostering participants' voluntary and candid provision of information.

Secondly, the survey instrument prominently featured a statement explaining the overarching purpose of the research and its exclusive utilisation for research-related objectives. Additionally, it

included a confidentiality pledge, assuring respondents that the information they provided would be treated with the utmost privacy and confidentiality.

Lastly, stringent criteria were established to uphold the reliability and validity of the gathered data. The inclusion criteria encompassed individuals who had granted explicit consent, registered students, and employed academic staff. Conversely, the exclusion criteria encompassed unregistered students, non-employed staff, and individuals who declined to provide consent to disclose information. These criteria were scrupulously applied to ensure the integrity and accuracy of the research outcomes.

Acknowledgements

We acknowledge the support of the African Development Bank (ADB) that funded the doctoral study on which this research was founded.

Declaration: We declare no conflict of interest.

Availability of data and material for data transparency

All data generated or analysed during this study are within this published article. The original datasets are available from the corresponding author on reasonable request.

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